Natural Heritage &
Endangered Species
Program

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Natural Community Fact Sheet
Coastal Plain Pondshore Community

Description
Coastal Plain Pondshore Communities are composed of a mixture of herbaceous and graminoid species growing on the exposed margins of coastal plain ponds; between the shallow water and the shrubs that surround freshwater ponds in sandy deposits of Massachusetts coastal areas. Bare patches of sand, sandy to muddy peat, or cobbles occur between the plants.

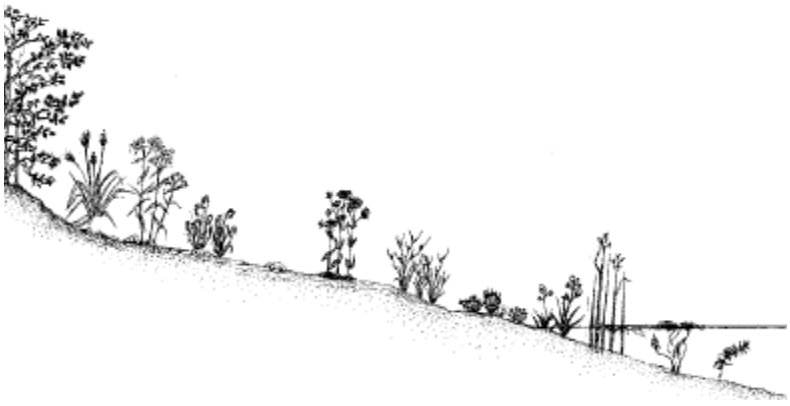

Coastal Plain Pondshore Community showing zonation. Photo: P. Swain, NHESP.

Environment
Coastal plain ponds occupy depressions in glacial outwash plains that are directly linked to the underground aquifer. The Coastal Plain Pondshore Community occurs in those ponds with no surface inlet or outlet, and with a gradual slope to the shore. The community develops best in small ponds or bays of larger ponds with little space for wind sweep that causes wave and ice damage to shorelines on large ponds. In most cases the substrates are sand or sandy glacial till through which the water moves easily. As a result, the water level rises and falls with the water table through the seasons, which in most years leaves exposed shores expanding throughout the summer. Many of the plant species of the community are able to start growth from seed, perennial basal leaves, or roots while inundated with water in the spring and grow in the increasingly dry, nutrient poor soils as the season progresses; others may germinate only when exposed. In wet years the water level does not recede as far as in dry years, and the constituent species may grow vegetatively while submerged, with little flowering, or may not grow or germinate at all. Not only do the water levels change through the year, but between years as well: only one year in about 5 may be dry enough for the community to develop fully. The lowering of water levels during the growing season is probably the single most important factor in providing suitable habitat for the plants of the Pondshore community.

The waters of coastal plain ponds tend to be nutrient poor and acidic, as is typical of eastern Massachusetts. The plants of the Pondshore community are particularly adapted to the nutrient poor conditions, and although often restricted t that environment, are able to compete with more widespread plants that require more nutrients. The periodic inundations of the shore also help to keep out shrubs and upland plants, and the periodic drying keeps out the obligate aquatic plants.

Characteristic species of Coastal Plain Pondshore Communities in Massachusetts
The Coastal Plain Pondshore community includes a mix of common and globally restricted plants. Many seldom occur elsewhere. Some may be locally abundant, mixed in with more common marsh emergents such as rushes, sedges, Boneset (*Eupatorium perfoliatum*), and Purple Gerardia (*Agalinis purpurea*).
The plants of the community appear to form zones between the water and the shrubs around the pond. The driest zone, inundated only in the highest water, may have New England boneset (*Eupatorium novae-angliae*) or Maryland meadow-beauty (*Rhexia mariana*) both considered rare in Massachusetts. Thread-leaved sundew (*Drosera filiformis*), common on these ponds, but uncommon elsewhere, and spatulate-leaved sundew (*D. intermedia*) are other plants of the higher shoreline.

Schematic representation of Coastal Plain Pond Shore community zonation



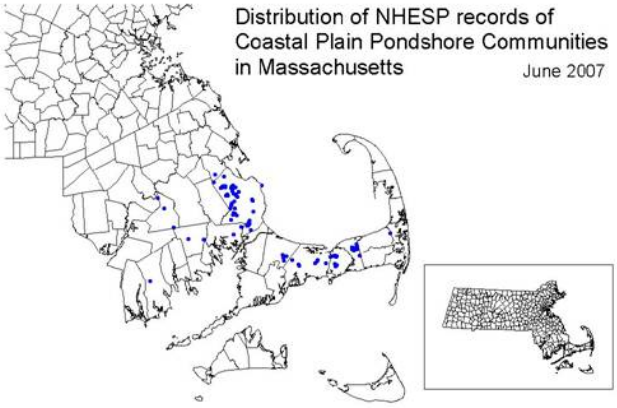
The figure shows a highly diagrammatic pond shore in a summer with low water. On the left is a highbush blueberry growing where it is seldom inundated. Down slope are a grass, New England Boneset, Thread-leaved Sundew, Plymouth Gentian, and rushes. The Slender Arrowhead, Bayonet Rush, and aquatic plants are in the water.

An intermediate area of beach provides habitat for most of the species of the Coastal Plain Pondshore Community. The globally restricted, but locally abundant, Plymouth gentian (*Sabatia kennedyana*) grows from the shallow water across a broad expanse of sand. Mixed in may be the yellows of golden-pert (*Gratiola aurea*) and goldenrod (*Euthamia tenuifolia*) and the pink of pink tickseed (*Coreopsis rosea*).

In the submerged or water-saturated areas may be slender arrowhead (*Sagittaria teres*) or a bladderwort (*Utricularia fibrosa* or *U. biflora*). Some ponds have many of these species, some have only one or a few. Many of the ponds have a large variety of rushes, sedges, and pipeworts that grow out into the open water.

Range

Coastal Plain Pondshore communities occur primarily on the Atlantic Coastal Plain, which extends from Texas and Florida to southern New Jersey, and in disjunct areas to Nova Scotia. Many of the species (Maryland Meadow Beauty, several bladderworts, and some of the sedges and rushes) are at the northern end of their distribution in southeastern Massachusetts. Southern ponds dry out in most years, and are called "bays," but their species composition is similar. Nova Scotia has a few coastal plain ponds with some of the same species as the community found in Massachusetts, and interestingly, many occur in the Great Lakes region in Michigan and Wisconsin.



The New England Pondshores occur in sandy substrate and kettle hole topography. There are several ponds on outwash sand plains in the Connecticut River Valley in Massachusetts that function similarly to coastal plain ponds, but which support fewer species. Cape Cod and southern Plymouth County have the best examples of Coastal Plain Pondshore Communities in New England.

Status in Massachusetts Threats and Management Recommendations:

Coastal Plain Pondshore communities have several immediate and long-term threats caused by human disturbance. The community requires natural fluctuation of the water levels along the shore. Artificially maintained high water levels reduce the area of shore available for the Pondshore community. Most of the plants of the community can withstand high water for a few years, which happens naturally, but most need to be out of water to reproduce. Human use of the Pondshores, including walking, offroad vehicles, and beach building, restricts plant growth. Experiments have shown that a few walking trips can create a trail where no plants grow. In areas of heavy use, the plants of the Coastal Plain Pondshore community can easily be eliminated. High nutrient leachate from improperly maintained septic systems poses the long-term threat of pond eutrophication. Overwintering populations of Canada geese may provide sufficient nutrient enrichment to change the character of the ponds, allowing algae and pondweeds not native to the ponds to grow and reduce the habitat available to the plants of the Pondshore community. Excessive drawdown from pumping for water consumption reduces natural fluctuations and allows woody species to advance down the shores.

Range map updated-2007; Original written 1990.